

SIXPENCE

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# AMATEUR RADIO

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# AMATEUR - RADIO

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## - RANDOM REFLECTIONS -

by

COMMENTATOR. (T. & R. BULLETIN)

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There are times when it is good to look back. Much that "Ham Radio" meant before the war put QRT to many of its activities, seems now to be a thing of the past. The empty shack, the dispersal of friends, the absence of QSL's in the morning post, the usual sked, which is now no more; these things have for many ended what was for them, the essence of "Ham Radio." As the war continues, where-ever erstwhile "hams" meet, they will sooner or later start reminiscing. "Do you remember the 1938 N.F.D.?" "Were you at the last convention?" "Do you remember..... and so it will go on.

It is only right that this should be so. As the war develops and involves more and more countries in an orgy of destruction, one by one the remaining beacons of amateur radio become extinguished, and one wonders whether some future day may come when the question will be heard, "What was this Ham Radio?" If it does, it will indeed be a sorry day. Whether or not it comes depends on how we conduct our affairs now. But before we say more on this point, let us consider what it is which makes our hobby unique among the activities of mankind. What is it about amateur radio which knits men of every nation together by a band of comradeship in a world stark mad with national hatred? What is it that makes two individuals separated by thousands of miles, who have never met or set eyes on each other, friends for life? What is it that insures hospitality in every foreign land....or did, at any rate before the war.....for he who can say, "I'm a fellow radio ham?" What is it about our hobby which attracts thousands of adherents in every civilised country in the world?

For some, no doubt, it is the fascination of communicating with another human being hundreds of miles away. It cannot be denied that there is an almost uncanny fascination in sending a radio signal far out across space and getting an intelligent answer back. For others the fascination lies in experimentation or as an outlet for their creative

- 2 -

instincts. No matter which of the above interests was the initial cause of the prospective amateur "joining up" - when he does get into the "fellowship" he soon finds that there exists a "something" - an indefinable sense of the greatest comradeship he has ever come across. No matter what his social status, what his income, what his creed, what his nationality or color, provided he abides by the unwritten laws of "ham" conduct -- which he will soon learn -- he is as good as the best. On the air, at local meetings, at conventions during his travels at home or abroad, where-over he comes up against others whose passport is a QSL card, he knows he will find hospitality and comradeship. This is the spirit which makes the amateur radio movement distinctive, which places it amongst the highest, most cultured, most uplifting of human activities. It is one of the best "Friendly Societies" the world has ever seen.

Upon what does the success of this comradeship in amateur radio depend? It depends chiefly on free intercourse and communication between its members. An international jargon, and a ready means of communication, have enabled all its members in the most distant parts of the world to keep in touch with one another. Conventions and local meetings have brought together groups of similarly-minded people and the spirit of the thing has spread until now there can hardly be a country where a "ham" isn't to be found.

But the "forces of evil have reared up their heads" - as the preacher would say. Not only do they wish to curtail our freedom in the wider spheres of life, to destroy our Nation, our democracy, our very country, but they are endeavouring to sow seeds of national hatred and jealousy and so disrupt the countries they wish to attack. International friendship is a thing they fear most. We amateurs know too well that the first signs of dictatorship are the disappearance from the "air" of the call signs of the subjugated country. Free intercourse with the outside world will not suit the dictators. Neither will meetings of groups of people behind closed doors. Neither will free discussion in society and club magazines. By stopping all these things that have managed effectively to turn their people from intelligent free-thinking individuals, with a sense of something worth while in life, into senseless automatons.

And now here is the moral. For obvious reasons the authorities have stopped our activities on the air. But they have not stopped our other activities. Our meetings can go on as before - not quite so conveniently perhaps, but there, the fellow who had the farthest to come always was the most regular! Our friendships can go on. We may be separated - we may not be able to meet on the train, in the cafe or at the "local" as we used, but we can write.

When the very foundations of "Ham Radio" are being shaken, it is up to us (who have watched it working and know it at its best) to see, by gathering together as we did of old, by talking of our hobby over our coffee and sandwiches or whatever it may be, by corresponding regularly with those with whom we should never

have thought of missing a sked, and extending towards other "Hams" the hospitality we would have shown in days gone by, that the spirit of our movement is kept alive, so that the day shall never come when the question is heard "What WAS that ham radio?"

....oOoO....

-- A NEW TYPE OF PICK-UP --

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The Philco Company in America has announced the production of a new type of pick-up. This new pick-up is novel in that it operates on the reflecting mirror galvanometer principle, which, it is believed, has not hitherto been applied commercially to this purpose.

The stylus has a permanent bell sapphire point, and, instead of moving a crystal or magnetic armature, it actuates a small thin mirror so that the lateral variations in the record grooves oscillate the mirror in accordance with the groove modulations. A pencil of light from a torch bulb type lamp shines on the mirror and, as the mirror oscillates, the light beam is deflected in conformity with the groove modulations. The reflected light is focused upon a photo-electric cell, the output of which is fed to an amplifier.

The small exciter lamp is argon-filled and fed from a high-frequency oscillatory source to avoid modulating the output by mains frequency flicker. As the stylus has to move, nothing but the minute mirror, the moving mass is low and so the needle impedance (stiffness) is small, and the light weight of the pick-up considerably reduces the pressure of the sapphire point on the record.

It is claimed that these two factors in combination markedly reduce record wear and surface noise. The frequency range of the pick-up is from 50 to 5000 c/s, any response above or below this range being purposely diminished to eliminate needle noise.

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Even though we are off the air the Institute still looks after your interests. Proof of this is shown by the Institute seeking further information on the recent Wireless possession Order.

Several inquiries had been received in regard to keys and microphones. The advice from the Department was that keys where used for morse practice, and microphones where used for radio purposes need not be included in the gear to be packed for sealing by Officers of the Department.

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## IMPROVED PERFORMANCE FROM THE REGENERATIVE

### I.F. AMPLIFIER.

By....I. Eby.

Many who have tried regeneration in an I.F. stage in their receivers have discarded it in favor of a crystal filter. A crystal filter provides rejection ordinarily not brought forth in a regenerative I.F. amplifier. However, in the circuit described, the "rejection" of a crystal filter can be approached closely and high gain maintained in the stage. The gain feature is one that the crystal cannot boast. Most crystal filters have considerable loss. If properly shielded and designed, a regenerative I.F. stage will be easy to adjust and will bring those weak signals out of the QRM practically as well as a crystal filter.

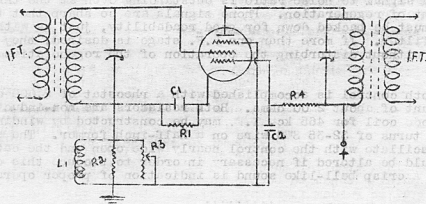
In the first two methods tried regeneration was obtained by (a) a feed back coil coupled to the secondary of the IFT, and (b) by capacity feed back from the plate to the grid of the I.F. tube. It was found that both methods provided good selectivity, but that there was no rejection on the undesired side of the signal. Stability was also not too good.

The circuit as shown was one circuit which at first didn't look particularly promising. It was tried, however, and surprisingly enough it performed to perfection. It is the same circuit as used in the "Jones" Super Gainer second detector.

In the experimental state the whole affair was unshielded and the regeneration control was boosted to the limit. Under these conditions the full capability of the single-signal feature was realized, with a rejection on the undesired side of the signal of about the same as the gain on the desired side.

All of the methods used were tried with both air core and iron core transformers and the circuit shown was the only one wherein the good selectivity and gain of the iron core unit was obvious. The second detector had to be changed immediately, however, because it was of the plate type and it blocked up on loud signals. In the present set a diode type rectifier is used. An infinite impedance detector could be used if desired. The screen voltage of the I.F. tube should be maintained constant, a voltage divider arrangement is suggested.

When aligning the set the usual modulated oscillator may be used on all circuits except the input I.F. transformer. The same method used to line up a Super Gainer should be used, i.e. the



C1, .25 mfd; C2, .1 mfd; R1, 1000 ohms; R2, 200 ohms;  
R3, 2000 ohms (var); R4, 50,000 ohms; L1, 70 turns 35 SWG on  $\frac{1}{2}$ "  
former (for 465kc)

regeneration should be boosted to a point just before the stage oscillates and the secondary trimmer adjusted with the help of the modulated oscillator after the succeeding stages have been lined up. Then the primary of the input transformer is adjusted, with the oscillator off until the I.F. stage drops out of oscillation. The I.F. gain is run up again and the procedure repeated. The reason for this method of alignment is that the cathode coil has a detuning effect on the secondary of the transformer. The B.F.O. is adjusted to whichever side of the signal is desired and also to the frequency pitch desired. Usually a 1,000 cycle note is best for reading weak signals.

Shielding is a good measure towards stability, and the cathode coil should be mounted close to the socket and I.F. transformer. The lead to the regeneration control on the panel should be shielded and a ground wire brought from the cathode coil to the control. The cathode coil itself need not be shielded unless desired, although any means to keep the regeneration solely in the grid -- cathode circuits is a means towards better rejection.

With this circuit full gain may be applied to all stages of the receiver without effecting the I.F. operation. This is an advantage over any of the other circuits tried, as in most of them the R.F. gain had to be backed down to get good I.F. gain with stability.

Good signal to noise ratio is outstanding even at the threshold point of regeneration. Phone signals are so sharp that the control must be backed down for good readability, just as with a crystal filter. If more than one I.F. stage is desired, they may be added without disturbing the operation of the regenerative stage.

Smooth control is accomplished with a rheostat of 2,000 ohms and a shunt of about 2 00 ohms. Both resistors are non-inductive. The cathode coil for 465 kc. I.F. may be constructed by winding about 70 turns of 32-35 SWG wire on a half-inch former. The stage should oscillate with the control nearly wide open and the cathode coil should be altered if necessary in order to produce this condition. A crisp bell-like sound is indication of proper operation.

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#### - TUBE LIFE -

##### An interesting discovery regarding tube life

The Bell Telephone Laboratories report a discovery which, if applicable to receiving and transmitting tubes as well as to the repeater tubes on which checks were made, should be of vital interest to every amateur.

Checks on life test records of various repeater tubes operating under unvarying conditions showed that invariably the rate of failure in a group of tubes when expressed in per-cent of the tubes remaining tends to become constant - just as though the tubes failed in random fashion. The same results were obtained in every case where sufficient data was kept on field trials. There is every reason to believe that the same law of probability will apply to receiving tubes and possibly to transmitting tubes, even when being punished in an amateur transmitter.

This means that a used tube, STILL IN PERFECTLY GOOD CONDITION, has a further life expectancy just as great as that of a brand new tube of the same type. At first glance this seems hard to believe, but after a little thought on the subject it is not so hard to accept. The reason is that the life of individual tubes in a large group will be found to vary widely from the average life or "life expectancy." Some will last only a few hours, some a few hundred, some a few thousand and some many thousands of hours. If the average life for the group is say 3,000 hours, it will be found that at the end of 3,000 hours only

37% of the group are still in service. The extra long life of the tubes which exceed the average life makes up for those that fail before 3,000 hours.

It is interesting to note that the practice of replacing all tubes periodically, whether it is done because uninterrupted service is of prime importance or because the tubes are old and they would soon start going out one at a time as their life expectancy is reached, is pure folly. The short lived tubes having already given up the ghost, the tubes remaining in service, even though they may have exceeded the average life expectancy, are likely to last as brand new tubes.

Practically every amateur knows of a case where a brand new transmitting tube, of reputable manufacture, failed after a very short period of service during which the tube was not abused. This should be no reflection on the manufacturer or his product. The tube may have a life expectancy (average for a large group) of possibly 5,000 hours when run at normal ratings. Even so an occasional one is bound to fold up after a few dozen hours, which will be compensated by an occasional one lasting 25,000 hours, or even more. Theoretically all tubes of a certain type should have a definite life span, at the end of which all of them elevate their toes skyward simultaneously. But such is not the case in practice. Manufacturers are doing their best to get at the root of the non-uniformity, but don't seem to be able to do so. They can improve and extend the average life of a certain type of tube, but still some will last ten times as long as others in the same service.

Of course the survival law falls down when carried to the extreme. It is true that according to this law of survival, in which a certain fixed percentage of surviving tubes fail every given number of hours, sooner or later a tube would be found that would last indefinitely. Of course no tube can last for ever, but it would be reasonable to believe that if a tube somehow did manage to survive, say 200,000 hours, it would have just as good a chance of lasting another 1,000 hours as would a new tube. This assumes, of course, a new tube which was made at the same time and on the same equipment. It would be highly probable that after 200,000 hours a manufacturer would have improved his manufacturing technique and would be turning out improved versions with greater life expectancy.

If this law of survival applies even approximately to transmitting tubes, and there appears to be no reason why it should n't, used tubes should be worth a lot more than they are. This takes for granted that the tube still checks up to the standards of a new tube and that it has not been rejuvenated in order to make it look good. Oddly, while this peculiar law of survival applies to tubes with oxide coated and thoriated tungsten emitters, it does not apply to pure tungsten filaments. The life of a tube with pure tungsten can be predicted accurately.



D I V I S I O N A L   N O T E S

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- Victorian Division -

The April meeting of the Division passed with the delivery of a lecture on photography by Mr. Jack Kling, 3JB to a very interested audience. The subject matter of the lecture was mainly concerned with developing of films, the best method of doing so, plus a few hints and kinks.

At the May meeting, which will be held on TUESDAY, 6th MAY (I've got the date right this time) Mr. Kling will continue the lecture advancing into the process of printing....and which reminds me....We're thinking of applying to the Defence Department for the loan of a few machine guns so that we can round up a few more to the meetings.....Surely you are not all QYL...or maybe its OW QRM.....Do what some of the boys do....get 'em to wait for you in the car, or dump 'em at the movies. Sorry if I've walked on anyones toes, but the idea was so good I just had to pass it on....

3DH...was the cause of a stunned silence when he turned up at the April meeting...reports that apart from the same story which everyone will tell about the packing of all RF gear in a secure receptacle, there is very little else. However, the old "bug" of recording which "Bit" way back in 1930 is still biting, and in spare time (and he modestly says "if any") when not toiling at 3AW, he spends in improving his recording technique. Says he's recorded just about every "Sound" the average ham is likely to meet...from thunder claps (during a genuine storm) to birds tweeting (sounds bad....Ed) outside the shack, plus the XYL playing the domestic piano. Has even recorded half a dozen commercial recordings on to one side of a 12" disc at 33 1/3 rpm.....saves a heck of a lot of record changing....and we can quite believe it.

3XJ...has rebuilt his 913 'scope with amplifiers and linear sweep complete in readiness for when someone comes back on fone. Has got the building bug, with the result that he's building a book-case....

3IW...has been playing round with 1.4 tubes. Hooked up a TRF with a 1N5 and 1D8GT with fair results on the BC and short wave bands but the triode of 1D8 lags a little on the regeneration. Reports polishing up his code, but radio is more or less shelved of late in favour of building astronomical telescopes.

3JB...has shifted during the past month. Jack reports that it's not so good when you've got a lot of gear.

3WE....the latest news I've got is that Bill is a drill instructor somewhere in Australia....The "Old Man" has three stripes too.

3WG....is very busy I hear....should know a lot about VK2 by now.

3XB....of the R.A.A.F. is now somewhere....someplace.

3FR....when last seen was driving a red van with lots of gold lettering on the side. Will be in camp next month with the sigs.

3YW....is still playing round with Ktal filters....maybe after you read this Cecil...you'll try and regn I.F. stage.

3MR....was heard from recently....is somewhere in the East. Snow reports that he is attached to the R.A.F.

3RN....after his sterling work on last months magazine Ron was unanimously elected "Official Printer" by the gang present. What he doesn't know about the duplicator now, isn't worth talking about.

Which reminds me....The Magazine Committee and helpers are considering compiling a new dictionary. After the new words used during the printing of the last magazine, they think the existing dictionaries are well and truly out of date....??????.

The congratulations this month go to Corporal Neil Templeton R.A. A.F. VK3HG, on his marriage to Miss Olive Skead, which took place on Saturday March 29th. Look us up sometime Neil.....

3HX....is wondering if the postman has forgotten all about him or if everyone has got writers cramp. No mail this month so not many notes.

- NEW SOUTH WALES DIVISION -

By.....VK2AJ0

The March General Meeting of the Division was held at the Y.M.C.A. Building on the 30th. The Senior Vice-President, Frank Goyen VK2UX officiated in the absence of the President who was still on the sick list. "Amateur Radio" in its new form was examined and discussed, with the result that a motion was passed congratulating the Victorian Division for the job they had produced under difficult circumstances, and assuring them of the support of this division for their enterprise. The meeting also welcomed some old faces which had been missing for some time, and also a couple of new members.

After the business session had been disposed of, the lecturer, Arthur Brown VK2LK set up his film projector and gave a very enjoyable talk about his experiences on a world tour (1938-1940) complete with motor-bike and movie camera.

He showed some fine scenes and incidents in Australia, Colombo, Malta, England, Switzerland and U.S.A. but as his tour had been interrupted by the war, naturally some of the films had been censored. His adventures were many and varied, including working in a television film in England, and an inside view of a Nazi jail in Germany as a guest of Adolph:

A recent visitor to Sydney was Jim Cowan VK2ZC, who with VK2NC made the first 5 metre QSO between Sydney and Newcastle. Jim's hobby these days is bee-keeping. Another caller in VK2 was VK4EL, Eric Lake of 4QG Brisbane, a famous DX hound in happier days before the time of "Sealed in a strong container." Well, perhaps 4QG can be heard in 114 countries....perhaps!!!!

The advertisers in "Amateur Radio" have been very willing Co-operators in making the new magazine a success, and members are asked to give them every support. Country members should write to them for catalogues and order by post from these firms.

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ADDITIONAL NEW SOUTH WALES HAMS IN DEFENCE FORCES

NAVY

Lt. Commander L. Swain VK2CS

R.A.A.F

F/Lt. T.G. Thorpe	VK2AMC	AC1	G. Brigden	VK2ACJ
AC1 A. Hodder	VK2DV	AC1	W. Smith	VK2IV
AC1. K. Avery	VK2AMS			

ARMY

Sgnlman H. Hilder	VK2AFT	Sgnlman T. Slawson	VK2AFN
Sgnlman T. Davis	VK2ADS	Sgnlman C. Roberts	VK2JV
Sgnlman L. Davies	VK2QI		

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STOP PRESS-----

FLASH----- Congratulations to Mr & Mrs Ron Higginbotham ,VK3RII on the arrival of a YL op.....

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The Division meets on the Third Thursday of each month at Y.M.C.A. Buildings, Pitt Street, Sydney, and an invitation is accorded to all Amateurs to be present.

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